

Archeointensity trend between 8th and 11th century in Okayama

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This study presents three new archeointensity estimated from Sayama-area (Bizen city, Okayama prefecture), for the period of 8th to 11th century. The baked-earth samples (archaeological artifacts) we used in this study were collected from old kilns (part of floor and wall) of Sue wares. These kilns were found during the course of five excavations which were conducted under an archaeological project (see Archaeological lab, Okayama University of Science, 2012; 2013) aiming to trace development-history of ceramics production activity in Sayama-area between Nara and Heian-era. If we adopt the archeological chronology based on the Sue-mura type (e.g. Nakamura, 2006), the Sayama-Shin-ike kiln and the Sayama-Higashiyama kiln were estimated to be under operation during last half of 8th century (? 775±25 year), and the Sayama-Higashiyama-Oku kiln to be at around 10 century (? 900±50 year) (See Archaeological lab, Okayama University of Science, 2012; 2013).

Various rock magnetic and stepwise thermal demagnetization experiments revealed that (1) the samples are generally resistant to laboratory heating, (2) shape anisotropy is small, and (3) main magnetic carriers are Ti-poor titanomagnetite with high blocking temperature. Archeointensity measurements were done by using the IZZI Thellier method (double heating method; Yu & Tauxe, 2005). We applied this method to 19 specimens from 15 samples of the Shin-ike kiln, 10 specimens from 10 samples of the Higashiyama kiln, and 19 specimens from 9 samples of the Higashiyama-Oku kiln. After applying a set of very strict criteria, averaged archeointensity (with one standard deviation) is obtained as follows: 61.6±4.4 μT for the Shin-ike kiln (N=4), 51.8±6.5 μT for the Higashiyama kiln (N=8), and 49.8±9.8 μT for the Higashiyama-Oku kiln (N=9). These values are not contradicted from the ones obtained by the Tsunakawa-Shaw method (Tsunakawa and Shaw, 1994; Yamamoto et al., 2003) though they are preliminary. Our new data show general agreement with the most recent archeointensity compilation in Japan (Yoshihara et al., 2003) and confirm the rapid intensity decrease at ~600 AD on average.

Keywords: Archeointensity, IZZI-Thellier method, Tsunakawa-Shaw method, Old kilns of Sue wares